

MEMORANDUMM. J. N.  
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LPS H&I  
RJCMEMO BY Jodean M. Giese TO Michael J. Nosanov DATE July 12, 1999FILE TITLE Radian International Proposal - IPP Operating Air Permit Revisions

In response to your request of June 24, 1999, the following is the Air Quality Business Team's (AQBT) assessment of the air quality issues associated with Radian's proposal to install its SynGypAS technology at Intermountain Generating Station (IGS). Data from Radian regarding expected changes in air emissions as a result of SynGypAS would be needed if a detailed analysis by AQBT is desired. Specifically, information is needed with regard to the proposed fuel blending percentage of pet coke in relation to coal, and the constituents of pet coke. This information will determine the net changes in emissions of PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, VOC, and toxic metals.

IGS Permit Modification/New Source Review Issues

As stated in your memorandum, "in order to achieve the chemical process required for IGS waste products, pet coke would be used as a supplemental boiler fuel."

AQBT reviewed the following IGS permits to determine the permitting process required in order to implement Radian's proposal:

- Prevention of Significant Deterioration (PSD) permit issued by EPA on June 8, 1980;
- PSD permit issued by the State of Utah Department of Health on October 17, 1983; and
- Title V operating permit issued by the State of Utah Department of Environmental Quality on January 9, 1998 (revised July 14, 1998).

AQBT believes that a Title V permit modification is required. We also believe that there is a basis for utilizing pet coke at IGS without going through New Source Review; our analysis is discussed below.

Background

In the Code of Federal Regulations (40 CFR Part 52.21), there are provisions that address permitting requirements for areas where the existing air quality is better than the national ambient air quality standards. These requirements are in place to prevent significant deterioration of air quality in these attainment areas. Millard County, Utah, is designated an attainment area.

In the definitions section of 40 CFR Part 52.21, a *major modification* is defined as "any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act." It further states that a physical or change in the method of operation does not include "Use of an alternative fuel or raw material by a stationary source which...the source is approved to use under any permit issued under 40 CFR 52.21 or under regulations approved pursuant to 50 CFR 51.166." I discussed this provision with Mr. Henry Nickel, legal counsel for Utility Air Regulatory Group and legal



counsel for IPP during the permit acquisition. Mr. Nickel believes that this provision can be interpreted such that if any of IGS's PSD permits are broad in its fuel specification, IGS may qualify for the fuel switch exclusion per 40 CFR Part 52.21 and, accordingly, will not be subject to New Source Review rules.

#### PSD Permit Issued June 8, 1980

The PSD permit issued in June 8, 1980 by EPA does not specify the type of coal IGS is required to burn. The condition states "No coal shall be burned which is incompatible with the Company's control equipment design... This coal quality data shall include the following: ... (vi) How any blending of the coal will naturally or intentionally occur (if applicable)..." This permit condition allows the blending of different types of coal as long as certain data is submitted to the regulatory agency for review.

NEED TO RE-CHECK -  
WE ARE RECD'D  
TO BE BITUMINOUS  
COAL!  
MKG

#### PSD Permit Issued October 17, 1983

This permit does specify the type of coal IGS is required to burn. This PSD permit was reissued in response to DWP's request to downsize the project from four to two units and modify the boiler ratings and air pollution control facilities for the project. The permit states "If coal other than bituminous is proposed for use, a notice of intent to modify shall be filed with the Executive Secretary in accordance with Section 3.1, UACR."

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#### Title V Operating Permit Issued in January 8, 1998

The Title V operating permit issued by the State of Utah Department of Environmental Quality (State) allows the use of bituminous and subbituminous coal as well as diesel or natural gas during start up, shut down, upsets, and flame stabilization.

#### Recommended Steps

Since the Title V operating permit is specific with respect to the use of fuel, state Title V rules require that we submit a notice of intent/letter to the state requesting a permit modification. In the transmittal letter, we can explain why we believe that the project should not be subject to New Source Review. Succeeding in the implementation of this approach will depend on the relationship that IPSC has with the state (which is positive I believe) as well as the state's interpretation of EPA's and its rules and regulations. Processing of a Title V minor permit modification from submittal of the notice of intent will take approximately three months before a final permit modification is issued.

If the state does not believe that IGS qualifies for the fuel switch exclusion as described in EPA's PSD regulations, we will have to perform an analysis to demonstrate that the emissions will not increase beyond state de minimus levels. We will need more detailed emissions information from Radian to make this determination. If emissions are expected to increase beyond de minimus levels, then the project will be subject to New Source Review, an extensive process that can take about a year to implement. A Title V major permit modification that would include this analysis would take approximately nine months from the submittal of the notice of intent before a final permit modification is issued.

### Anhydrous Ammonia

Radian proposes to use coal blended with petroleum coke which will result in higher production of sulfur compounds. The proposal states that anhydrous ammonia will then be used to react with the sulfur compounds to produce ammonium sulfate, an agricultural fertilizer. Generally, from an environmental standpoint, it is preferred that aqueous ammonia (29% concentration) be used instead of anhydrous ammonia (100% concentration).

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However, since IGS does not currently store any ammonia on-site, this would require a revision to the Risk Management Plan (RMP) within six (6) months of installing and operating the process change if the amount stored is over the 10,000 lbs. threshold. If the amount stored on-site is under 10,000 lbs., then no update to the RMP is required. The radius of impact would need to be calculated based on the size and shape of the anhydrous ammonia storage on-site. Our initial estimates using EPA's RMP Comp Program, the radius of toxic endpoint distance (radius of impact) is as follows, using the worst-case scenario of liquified ammonia under pressure from a single storage cylinder being released completely and immediately into the environment:

Cylinder size:	1 ton	Radius of impact:	0.8 miles
	2 tons		1.2 miles
	3 tons		1.4 miles
	4 tons		1.6 miles
	5 tons		1.8 miles
	10 tons		2.6 miles
	20 tons		3.6 miles
	25 tons		4.0 miles

Even under these worst-case scenarios, the impact to an uncontrolled release of 25 tons of anhydrous ammonia would not affect the public sector, which is located more than 4 miles away from IGS.

### Heavy Metals

Additional information is needed from Radian regarding the toxic metals found in pet coke to determine the potential impact resulting from its use. For example, vanadium is found in pet coke and is regulated under Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA). EPCRA would require reporting of new or increased emissions of toxic metal compounds under EPCRA's Toxic Release Inventory (TRI).

When Utah coal is used, vanadium is absent from the combustion waste stream. Currently, the bottom ash is either land-filled or used as road base or top soil. The bottom sludge from the scrubber (rich in calcium) is mixed with approximately 75% of the fly ash and then land-filled, and approximately 25% of the remaining fly ash is sold. It is our understanding that currently it is not cost-effective to sell the gypsum generated from the scrubber sludge, as there are sufficient supplies of gypsum in the region, and the chlorides found in the gypsum would need to be removed before sold.

The use of pet coke would introduce vanadium into the waste stream (e.g., fly ash and bottom ash, and trace amounts of the metal that escape the bag house into the gypsum or ammonium sulfate). Anhydrous ammonia would replace the use of limestone in the scrubber. The bottom ash would be land-filled or used on-site. Consequently, concentrations of toxic metals found in the fly ash or ammonium sulfate may impact their marketability.

### Recommendations

To ensure that heavy metals are at levels protective of human health and the environment, we recommend that a risk assessment be performed that considers exposure pathways and potential receptors for each proposed use. In lieu of conducting a site-specific risk assessment, generic look-up tables, such as the risk-based concentrations provided in EPA's Region 9 1998 Preliminary Remediation Goals Table, could also be used to initially evaluate potential risks.

We recommend that analytical data for the following metals be collected for the pet coke to determine if concentrations in the combustion waste stream will be above risk-based standards:

EPA Region 9 Preliminary Remediation Goals (PRGs) for Selected Toxic Metals										
Contaminant	Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m <sup>3</sup> )		Tap Water (ug/l)		Soil Screening Levels	
									Migration into Ground Water	
									DAF 20 (mg/kg)	DAF 1 (mg/kg)
Vanadium	5.2E+02	nc	1.3E+04				2.6E+02		6.0E+03	3.0E+02
Nickel (soluble salts)	1.5E+03	nc	3.7E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00
Nickel subsulfide			1.1E+04	ca	4.0E-03	ca				
Antimony	3.0E+01	nc	7.5E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
Arsenic	3.8E-01	ca	3.0E+00	ca	4.5E-04	ca	4.5E-02	ca	2.9E+01	1.0E+00
Beryllium	1.5E+02	nc	3.4E+03	nc	8.0E-04	ca	7.3E+01	nc	6.3E+01	3.0E+00
Cadmium	3.7E+01	nc	9.3E+02	nc	1.1E-03	ca	1.8E+01	nc	8.0E+00	4.0E-01
Cobalt	3.3E+03	nc	2.9E+04	nc	2.1E-02	nc	2.2E+03	nc		
Lead	4.0E+02	nc	1.0E+03	nc			4.0E+00	nc		
Manganese	3.1E+03	nc	4.5E+04	nc	5.1E-02	nc	1.7E+03	nc		
Mercury	2.2E+01	nc	5.6E+02	nc			1.1E+01	nc		
Selenium	3.7E+02	nc	9.4E+03	nc			1.8E+02	nc	5.0E+00	3.0E-01

Note: ca = Cancer PRG, nc = Noncancer PRG, \* indicates that the noncancer PRG ≤ 100X the cancer PRG

Additionally, the range of concentrations of other toxic metals in pet coke that are not found in Utah coal should be identified in order to clearly understand the other toxic metal impacts of using pet coke. As such, we recommend that a full screening of metals be conducted for pet coke to identify other toxic metals not found in coal. Analytical data should be collected using the sampling protocols under EPA SW-846 (Chapter 9) test methods. Such screening should take approximately 2-3 weeks and cost less than \$500.

July 12, 1999

If you have any questions or require additional information, please contact me at extension 70409.

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c: Chuck DeVore  
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